

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>				1. CONTRACT ID CODE <b>J</b>		PAGE OF PAGES <b>1 2</b>	
2. AMENDMENT/MODIFICATION NO. <b>0002</b>		3. EFFECTIVE DATE <b>20 April 2004</b>		4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO. (If applicable)	
6. ISSUED BY  <b>U.S. ARMY ENGINEER DISTRICT, ALBUQUERQUE CORPS OF ENGINEERS 4101 JEFFERSON PLAZA, N.E. ALBUQUERQUE, NEW MEXICO 87109-3435</b>		CODE		7. ADMINISTERED BY (If other than Item 6)		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)				<input checked="" type="checkbox"/> 9A. AMENDMENT OF SOLICITATION NO.  <b>W912PP-04-R-0011</b> <input checked="" type="checkbox"/> 9B. DATED (SEE ITEM 11) <b>18 March 2004</b> <input type="checkbox"/> 10A. MODIFICATION OF CONTRACTS/ORDER NO.   <input type="checkbox"/> 10B. DATED (SEE ITEM 13)			
CODE		FACILITY CODE					

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☒ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

**13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS,  
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

(✓)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

**E. IMPORTANT:** Contractor ☐ is not, ☐ is required to sign this document and return \_\_\_\_\_ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

**PROJECT: DESIGN/BUILD, ARSENIC TREATMENT SYSTEMS, KIRTLAND AIR FORCE BASE, BERNALILLO COUNTY, NEW MEXICO**

1. This is Amendment No. 2 to Solicitation No. W912PP-04-R-0011; 18 March 2004. The following revisions shall be incorporated into the specifications. All other provisions shall remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR  <div style="border-top: 1px solid black; width: 100%; text-align: center;">(Signature of person authorized to sign)</div>	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA  BY <div style="border-top: 1px solid black; width: 100%; text-align: center;">(Signature of Contracting Officer)</div>	16C. DATE SIGNED

2. SOLICITATION, OFFER, AND AWARD, Standard Form 1442: In Block 13A, change the date for receipt of proposals from "28 Apr 2004" to "05 May 2004". Time remains unchanged.

3. SPECIFICATIONS: Delete the following listed pages and substitute the pages attached hereto. On the revised pages, for convenience, changes are emphasized by the amendment number in parentheses before and after changes from the previous issue. All portions of the revised (or new) pages shall apply whether or not changes have been indicated.

Delete Page

Insert Page

Volume 1 of 3

Proposal Schedule, Page 3 thru 3c	Proposal Schedule, Page 3 thru 3c
00800-2	00800-2
01010-4	01010-4
01010-6	01010-6
01010-8 thru 01010-13	01010-8 thru 01010-13b
01010-50 thru 01010-51	01010-50 thru 01010-51
01010-56	01010-56
01010-58 thru 01010-59	01010-58 thru 01010-59
01010-62	01010-62

Volume 3 OF 3

Appendix Index

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Appendix Index

Appendix C, Well #1 Peerless Pump (Insert after Well #1)

Appendix C, Well 3 (Insert after Well #1, before Well 4)

Appendix N, Supplemental Water System Information (New appendix)

/////////LAST ITEM/////////

Solicitation No. W912PP-04-R-0011

Page 3 of 193

PROPOSAL SCHEDULE  
(To be attached to SF 1442)

Item No.	Description	Quantity	Unit	Unit Price	Amount
<u>BASE BID</u>					
0001	Total Cost For Design of Arsenic Treatment Systems, Complete	Job	Sum	***	\$ _____
(2)	0002 Total Cost For Construction of Arsenic Treatment Systems Including Demolition, Two (2) Million Gallon Water Tank, Piping and Appurtenances, Pumps, Auxiliary Booster Pump Station, Generators, Chlorination Building and System, Lightning Protection For Building 20370, SCADA System, Fencing, Rigid and Flexible Pavement, Striping, Curb and Gutter, Sidewalks, and All Associated Work, Complete	Job	Sum	***	\$ _____
0003	Final As-Built Drawings	Job	Sum	***	\$ <u>9,000.00</u>
0004	Operations and Maintenance Manuals	Job	Sum	***	\$ <u>9,000.00</u>
TOTAL AMOUNT - BASE BID					\$ _____

(2)

PROPOSAL SCHEDULE (Cont'd)

Item No.	Description	Quantity	Unit	Unit Price	Amount
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BID OPTION NO. 1

(2) 0005 Deleted

0006 Deleted

0007 Deleted

0008 Deleted

TOTAL AMOUNT - BID OPTION NO. 1

\$ \_\_\_\_\_

BID OPTION NO. 2

0009 Deleted

0010 Deleted

(2)

TOTAL AMOUNT - BID OPTION NO. 2

\$ \_\_\_\_\_



PROPOSAL SCHEDULE (Cont'd)

Item No.	Description	Quantity	Unit	Unit Price	Amount
<u>BID OPTION NO. 3</u>					
0011	Total Cost for Design and Construction of Fiber Optic Connections and Associated Equipment In Lieu of Spread-Spectrum Radio Connections, Complete	Job	Sum	***	\$ _____
0012	Final As-Built Drawings	Job	Sum	***	\$ <u>2,000.00</u>
TOTAL AMOUNT - BID OPTION NO. 3					\$ _____

RECAPITULATION

1.	TOTAL AMOUNT - BASE BID	\$ _____	
(2)	2. TOTAL AMOUNT - BASE BID AND OPTION NO. 3	\$ _____	(2)

NOTES:

1. Award of all Proposal Items will be made to one proposer. Proposers must bid on all items.

2. PROGRESS PAYMENT REQUESTS made by the Contractor pursuant to the provisions of Contract Clause, PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS, shall be submitted on ENG FORM 93 to the billing office as designated on Block 26, Standard Form 1442, Solicitation, Offer and Award, back. ENG FORM 93 shall be submitted to that office on the 1st of each month in appropriate form and certified. Photocopies of the form shall be furnished on that same date to the Corps of Engineers offices designated at the Pre-Construction Conference.

3. EXERCISE OF OPTIONS. The Government reserves the right to exercise the option(s) by written notice to the Contractor either singularly or in any combination for up to 90 calendar days after award of the Base Bid without an increase in the Offeror's bid price. Completion of added options shall continue at the same schedule as the Base Bid unless otherwise noted in the SPECIAL CLAUSES, Paragraph 1, COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK.

PROPOSAL SCHEDULE (Cont'd)

NOTES: (Cont'd)

4. EVALUATION OF OPTIONS: (FAR 52.217-5) (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirements. Evaluation of options will not obligate the Government to exercise the options(s).

5. ARITHMETIC DISCREPANCIES: (MAR 1995)

(a) For the purpose of initial evaluation of bids, the following will be utilized in resolving arithmetic discrepancies found on the face of the bidding schedule as submitted by bidders:

- (1) Obviously misplaced decimal points will be corrected;
- (2) Discrepancy between unit price and extended price, the unit price will govern;
- (3) Apparent errors in extension of unit prices will be corrected;
- (4) Apparent errors in addition of lump sum and extended prices will be corrected.

(b) For the purposes of bid evaluation, the Government will proceed on the assumption that the bidder intends the bid to be evaluated on basis of the unit prices, extensions, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids. (EFARS 52.214-5000)

SCHEDULE (Cont'd)

SPA APR 2002

Item of Work	Commencement Time	Completion Time in Calendar Days After Receipt of Notice to Proceed	Liquidated Damages Per Calendar Day
<u>BID OPTION NO. 1</u>			
(2)	1.4 Deleted		
	1.5 Deleted		
	1.6 Deleted		
<hr/>			
<u>BID OPTION NO. 2</u>			
	1.7 Deleted		
	1.8 Deleted		(2)
<hr/>			
<u>BID OPTION NO. 3</u>			
1.9 Design and Construction of Fiber Optic Cable and Connections, Complete	No additional time will be provided. The work shall be accomplished within the duration specified for the base bid.		
1.10 Final As-Built Drawings	(See Note 2)	(See Note 2)	

### 3. CIVIL DESIGN

3.1 **General.** The project consists of the design and construction of additions to, and modifications of, the Kirtland Air Force Base (KAFB) domestic water system as described within this RFP. The additions/modifications are required to ensure that arsenic levels in the drinking water are in compliance with the revised maximum contaminant level (MCL) of 10 µg/L (10 ppb) mandated by the Safe Drinking Water Act. Public water systems must comply with the revised standard by January 23, 2006. Production of drinking water in compliance with the revised arsenic MCL will be accomplished by blending the water produced by the Base wells prior to distribution to consumers. Required additions to the water system include new well collection pipelines and associated appurtenances, and a new 2 million gallon (MG) water blending and storage tank including piping, appurtenances and chlorination system for the tank. Modifications to the water system include replacement of existing supervisory control and data acquisition (SCADA) system equipment, replacement of existing booster pumps and associated equipment at the main Base booster station, and upgrade of the existing SCADA control room at the main booster station. A complete design shall be developed to accomplish the requirements as identified in this RFP. The design shall comply with Government and Industry standards.

#### 3.2 **Technical Criteria and Standards.**

3.2.1 American Water Works Association (AWWA), Manual of Water Supply Practices, Water Chlorination Principles and Practices.

3.2.2 American Water Works Association Standards, latest edition.

3.2.3 Great Lakes Upper Mississippi River Board of State Public Health & Environmental Managers, Recommended Standards for Water Works (Ten States Standards), 1997.

3.2.4 Kirtland Air Force Base, New Mexico, Design Compatibility Standards, latest edition.

3.2.5 MIL-HDBK-1005/7A, Water Supply Systems, 1 September 1999.

3.2.6 National Association of Corrosion Engineers (NACE) Criteria and Standards.

3.2.7 New Mexico Administrative Code, Title 20, Chapter 7, Part 10, Drinking Water Regulations - 20.7.10 NMAC.

3.2.8 Unified Facilities Criteria (UFC) 3-600-01, Design: Fire Protection Engineering for Facilities, 17 April 2003.

3.2.9 U.S. Army Corps of Engineers, Southwestern Division, Architectural and Engineering Instructions Manual (CESWD-AEIM), October 2000.

(2)

(2)

3.3 **Guide Specifications.** The civil-related specifications listed below shall be used in the design and construction documents of this project. The Contractor shall edit these specifications, as applicable, to fit project

**3.7 Water System Additions/Modifications.** Additions/modifications shall be made to the existing Base water system as described in this RFP to ensure that, by blending the water produced from the Base domestic production wells, well water pumped into the distribution system, through the main booster station, is in compliance with the revised MCL for arsenic of 10 µg/L. The basis for the additions/modifications to the water system, except as indicated in this RFP, is Alternative 2 from the *KAFB Drinking Water Blending Feasibility Study*, December 5, 2002 by CH2M HILL. A copy of the study is located in the appendix. Required additions/modifications include: construction of a new 2MG ground storage blending tank including associated piping, appurtenances, and chlorination station; construction of new well discharge piping, valving, and appurtenances to collect and convey flow from the wells to the new blending tank; installation of new, larger pumps and associated equipment at the main booster station; construction of a new water line to convey City of Albuquerque water to the blending tank; and upgrade of the existing SCADA system. Following are the specific additions/modifications that shall be made to the Base water system. See Figure 4-2 of the *KAFB Drinking Water Blending Feasibility Study* for a schematic drawing of the required water system modifications and Figure B-2 for a scaled drawing showing the required modifications. New water lines referred to in this section of the RFP are underground lines unless indicated otherwise.

(2) **3.7.1 New Blending Tank.** Water from Base wells 1, 2, 3, 4, 14, 15, and 16 will be diverted, via new well discharge piping, to a new blending tank that is to be designed and constructed by the Contractor. Water will be transferred from the new blending tank to the two existing 1 million gallon (MG) ground storage tanks, located adjacent to the main Base booster station (water plant), through a new transfer line. The high water level within the existing ground storage tanks is maintained at 24 feet above the tank floor. As-builts prepared in 1950 indicate the floor elevation of the tanks to be at an elevation of 5389.0 feet. The new blending tank shall be a 2MG, welded steel (not bolted), ground storage tank for potable water complete with all required appurtenances. The tank shall be a circular, above-ground, anchored, flat-bottomed tank that shall be designed and constructed in accordance with AWWA D100. The tank shall be located at the existing tree farm lot, which is located at the northwest corner of Texas and M streets. The tree lot is just south of Bldg 20375 and just east of the DOE childcare center (Bldg 20401). The Contractor shall determine the allowable height of the new tank based on clearance requirements from the nearby airfield and, to ensure gravity flow from the new tank to the two existing 1MG ground storage tanks. The Contractor shall verify that the tank height and location meets all FAA and military clear zone requirements. Refer to UFC 3-260-01 *Airfield and Heliport Planning and Design* for military clear zone requirements. The runway nearest the new tank site is classified as a Class B IFR runway. It is preferred that the new tank be designed so that water will be transferred from the new tank to the two existing 1MG tanks to their high water level without pumping. If pumping is utilized for water transfer between tanks, a duplex system shall be provided with each pump capable of providing the maximum required flow rate while the other pump is off. See paragraph STRUCTURAL DESIGN for tank structural and foundation requirements.

(2)

**3.7.2 New Blending Tank Coating System.** The new blending tank coating system, both interior and exterior, shall be in accordance AWWA D102. The interior of the blending tank shall receive AWWA D102 "Inside Coating System No. 2" which



(2)

station. The line shall be of sufficient capacity to fill the two 1MG tanks while these tanks are supplying the booster station pumps at maximum booster station output. The Contractor shall determine the optimum size for this line based on the hydraulic conditions required to transfer the water between the new blending tank and the two existing 1MG ground storage tanks. The new transfer line shall connect the outlet of the new blending tank to the existing 18-inch water line currently used for filling the two existing 1MG ground storage tanks. This 18-inch line, which is shown just west of the two 1MG tanks on Figure B-2 of the *KAFB Drinking Water Blending Feasibility Study* conveys flow from wells 1, 2, and 4 to fill the two existing 1MG ground storage tanks. The new transfer line shall connect to the existing 18-inch line at a point upstream (to the west) of the existing concrete meter vault that exists upstream of the location where the 18-inch line splits to individually fill the two existing tanks. **Note: Figure B-2 of the *KAFB Drinking Water Blending Feasibility Study* incorrectly shows a line connecting the blending tank to the nearest, existing ground storage tank only, which is incorrect.** See Diagram 1 in Appendix N for a conceptual view of the blending tank transfer line. A hand wheel operated gate valve housed in a valve vault shall be provided on the new transfer line so that this line can be closed if desired by the water system operators. A means for automatically stopping the flow from the new blending tank to the existing ground storage tanks when these tanks are full shall be provided to prevent overflow at the existing ground tanks. The method for stopping the flow will depend on whether gravity is utilized or pumping is provided for water transfer between tanks. If an altitude or other valve is used for automatic flow stoppage to the blending tank it shall be housed in a concrete valve vault.

(2)

**3.7.2.5 New Blending Tank Security Fencing.** A chain link fence with 6-ft fabric height and outriggers with 3-strands of barbed wire shall be provided at the tank site to enclose the new tank and chlorination station. A 12-foot wide double swing gate shall be provided for vehicle access to the tank and, for personnel access, a 3-foot wide swing gate shall be provided. The gates shall be provided with locks. The fencing, gates and locks shall meet the requirements in guide specification 02821 - Fencing.

**3.7.3 New City of Albuquerque (COA) Water Diversion Line.** A new 16-inch water line shall be provided for blending of City of Albuquerque water with Base well water in the new blending tank. The new 16-inch line shall be connected by tee to an existing 14-inch line that connects the Base distribution system to the City water system. The existing 14-inch line runs parallel to Gibson Blvd on the north side of the street. The existing connection to the City system is located at the northeast corner of the Gibson and Louisiana Blvd intersection. The connection to the existing 14-inch line shall be made just east of the existing pump and metering station identified as building 20183 on Figure B-2 of the *KAFB Drinking Water Blending Feasibility Study*. **Note: the location of the required new connection, shown on Figure B-2 of the Study, is incorrect.** The new tee connection shall be valved so that flow from the City system can be diverted either to the new blending tank or into the distribution system as is currently done. The new diversion valves shall be gate valves of the same nominal diameter as the line on which they are installed. The existing flow meter located at the metering station (Bldg 20183) shall be connected to the SCADA system for remote monitoring, by the Base, of the flow from the City

(2) system into the Base system. The existing meter is a 14-inch propeller type meter manufactured by Sparling. The meter is SCADA ready except that the Contractor shall provide a flow transmitter for the meter. The new 16-inch City water diversion line shall discharge to the new 18-inch well collector line, described in the following paragraphs, at the intersection of Gibson Blvd and San Pablo St. (2)

**3.7.4 New Well Collection Lines.** The discharge points of several Base wells, as well as the discharge point of the Gibson Blvd, City water connection into the Base water system will be revised, as part of this project, to facilitate blending of the Base water supply. The flow from wells 1, 2, 3, 4, 14, 15, and 16 and, from the Gibson Blvd City water connection will be collected and diverted to the new 2MG blending tank before it is pumped, at the main booster station, into the distribution network. The well collection lines shall be modified as indicated in the following subparagraphs.

(2) **3.7.4.1 New Collection Line for Wells 1, 2, and 4.** Currently, raw water produced at wells 1, 2 and 4 is conveyed through a series of underground pipelines to two existing, 1MG ground storage tanks. Well 1, located in a parking lot near the southeast corner of Pennsylvania St and K Ave and west of the two existing 1MG ground storage tanks, discharges its flow to the two ground tanks through an 8-inch line which increases to an 18-inch line. The combined raw water flow from wells 2 and 4 is conveyed through a 16-inch line to the vicinity of the two 1MG ground tanks where it is then combined with the flow from well 1 at the 18-inch main supply line to the two ground tanks. Water produced at wells 1, 2, and 4 shall be diverted, as part of this project, to the new 2MG blending tank by modifying the discharge piping from these wells as follows. A new 16-inch diversion line and valving shall be constructed to divert the flow from wells 1, 2, and 4 to a new 24-inch well collection line as shown on Diagram 1 in Appendix N. The new 16-inch diversion line for these wells is shown near the intersection of Pennsylvania St and M Avenue on Diagram 1. As shown on this conceptual diagram the new 24-inch well collection line will convey the combined flows from wells 1, 2, 3, 4, 15, 15, and 16 and the new City diversion line to the new blending tank.

(2) **3.7.4.2 New Collection Line for Well 3.** Currently, water from well 3 is disinfected and pumped to a 0.5MG ground storage tank located adjacent to the well. The water is then pumped by booster pump into the distribution system through a 12-inch line. A new 10-inch line shall be constructed to divert water from well 3 to the new blending tank. The new collection line shall be connected to the existing 12-inch line as close to the existing booster station as practicable. The new 10-inch line shall generally follow the route shown on Figure B-2 of the *KAFB Drinking Water Blending Feasibility Study*. In the vicinity of Gibson Blvd and San Pablo St the new 10-inch line from the well 3 booster station shall be increased to an 18-inch line and shall be connected to the new 16-inch City water diversion line mentioned in paragraph: **New City of Albuquerque (COA) Water Diversion Line.** The new 18-inch line carrying the combined flows from the City diversion line and well 3 shall generally follow the route shown on Figure B-2 of the *KAFB Drinking Water Blending Feasibility*



Study from the vicinity of Gibson Blvd and San Pablo St to the intersection of K Avenue and Pennsylvania St. From the K Avenue and Pennsylvania St intersection the 18-inch line shall continue south to the vicinity of the M Avenue and Pennsylvania St intersection. **Note: This routing is different than that shown on Figure B-2 of the KAFB Drinking Water Blending Feasibility Study.** See Diagram 1 in Appendix N for a conceptual diagram of the new routing. In the vicinity of the M Avenue and Pennsylvania St intersection the new 18-inch line will connect with the new 20-inch collection line for wells 14, 15, and 16 mentioned below.

(2)

3.7.4.3 **New Collection Lines for Wells 14, 15, and 16.** Currently, water from wells 14, 15, and 16 is disinfected at each well site then direct-injected into the distribution system near each well site. As part of this project, water from these wells shall be collected and diverted to the new 2MG blending tank. A 14-inch line shall be constructed to convey flows from well 14 to the vicinity of the current discharge location, into the distribution system, of well 15. At this location, the 14-inch line shall be increased to an 18-inch line and the existing discharge line of well 15 shall be connected to the new 18-inch line. The new 18-inch line shall be constructed from this point to carry the combined flows from wells 14 and 15 to the vicinity of well 16. At well 16 the 18-inch line shall be increased to a 20-inch line and the existing discharge line from well 16 shall be connected to the new 20-inch line. The new 20-inch line shall convey the combined flow from wells 14, 15, and 16 from the vicinity of well 16 to the vicinity of the intersection of Pennsylvania St and M Avenue. **Note: Although the new 20-inch line is shown on Figure B-2 of the KAFB Drinking Water Blending Feasibility Study to follow Ridgcrest Ave through the Zia park housing area, this line shall be routed around and outside the housing area to the south of the housing area.** At the M Avenue and Pennsylvania St intersection the new 20-inch line will be connected to the new 18-inch line carrying the combined flows from the new City water diversion line and well 3 and increased to a 24-inch line. The new 24-inch line will convey flow to the new blending tank as shown conceptually on Diagram 1 in Appendix N. **Note: Routing of the new 24-inch line described here and shown on Diagram 1 is different than the routing shown on Figure B-2 of the KAFB Drinking Water Blending Feasibility Study.** New gate valves shall be provided at the connection points of wells 14, 15, and 16 with the new well collection line so that flow from these wells can be diverted into either the new collection line or, in an emergency, direct-injected into the distribution system as is currently done. The new gate valves shall be hand wheel operated and installed within concrete valve vaults. These valve vaults shall have lockable covers as required in paragraph: **Valve Vaults** below to prevent unauthorized persons from gaining access to the vaults and operating the valves.

(2)

(2)

3.7.5 **Auxiliary Water Diversion Line.** The Contractor shall install an 18-inch auxiliary water diversion line as shown conceptually on Diagram 1 in Appendix N. This line will give Base water system operators additional flexibility in operating the system. The Contractor shall determine the optimal routing of this line.

(2)

3.7.6 **Pump Station Upgrade.** The reconfiguration of the discharge points of wells 3, 14, 15, and 16 from direct injection into the distribution system to discharge through the main booster station pumps, as part of this project,

(2)

will require the replacement of the four existing pumps in the main booster station with larger capacity pumps. Note: the word "pump" in this section of the RFP refers to the assembly that includes the pump, pump motor, and miscellaneous equipment that comprises a complete pump system. The new, larger capacity pumps shall be the same type as those currently installed in the pump station. Each of the four existing pumps is a 100-hp, vertical turbine type pump mounted to the floor of the main booster station. The pump turbines are located below the floor. See the appendix for the pump curves for the existing pump station booster pumps. The Contractor shall determine the required capacity of the new main booster station pumps. The new pumps shall be selected so that they will be capable of pumping the maximum daily demand, for the Base, into the distribution system within a 24-hour period, with no more than three pumps concurrently in operation. The maximum daily demand that shall be used to size the pumps is 7 million gallons per day. The four new booster pumps shall be of equivalent capacity. In conjunction with the replacement of the booster pumps, the Contractor shall upgrade piping, fittings, and any miscellaneous equipment, as required, for the satisfactory and complete installation of the pumps. The inlet piping from the two existing 2 MG ground storage tanks to the pumps and the outlet piping from the pumps to the 20-inch trunk line in Texas St shall be evaluated for their adequacy to convey the maximum daily demand. Any of this piping that is determined, based on calculations, to be inadequate shall be replaced as part of this project. In addition, the Contractor shall upgrade associated electrical equipment at the main booster station, as required, to adequately control and supply power to the new pumps. See paragraph ELECTRICAL DESIGN for electrical system upgrade requirements for this project. An hour meter shall be installed on each new pump/motor assembly. The existing Cla-Val pilot-operated, booster pump control valves, currently installed on the outlet side of each of the four existing booster pumps are newly installed. These valves shall be reused if it is determined by a representative of Cla-Val that they will operate satisfactorily with the new booster pumps selected by the Contractor. The Contractor shall provide a certification from Cla-Val that the valves are suitable for re-installation with the new pumps.

- (2) 3.7.7 **Pumps.** Water pumps installed in this project shall be in accordance with specification section 11211 - PUMPS: WATER, CENTRIFUGAL. Pump impellers and wearing rings shall be bronze. Pumps shall have mechanical seals. (2)
- (2) 3.7.8 **Auxiliary Booster Pump Station.** This paragraph describes the requirements for the design and construction of an auxiliary booster pump station adjacent to the new 2MG blending tank. The Contractor shall design and construct an auxiliary booster pump station adjacent to the blending tank to provide an alternative method of pumping water from the blending tank into the distribution system. The booster station shall be designed to pump water from the new 2MG blending tank outlet into the 20-inch trunk water line that runs parallel to Texas St. The new booster pump shall be of the same type and capacity as one of the four new pumps that are to be provided by the Contractor to replace the pumps in the pump station. To minimize pressure surges when the pump is operated the Contractor shall install, immediately downstream of the pump, a pilot-operated, solenoid controlled, booster pump control valve with built-in check valve. The auxiliary booster pump station shall include

all piping, valves, fittings, electrical systems, control systems, SCADA system, and any other miscellaneous equipment required to provide a completely functional booster station. The booster station pump shall be capable of fully automatic or manual operation.

(2)

- (2) 3.7.9 **Existing Pump and Metering Station (Bldg 20183) Modifications.** A new pilot-operated, solenoid controlled, booster pump control valve with built-in check valve shall be installed within the existing pump station for pressure surge control. The valve shall be installed immediately downstream of the existing pump that is housed within this building. In addition to providing surge control for the water system downstream of the pump when it is started, the valve shall be installed and configured to prevent City of Albuquerque water from entering the Base system when the booster pump is off. When the booster pump is on the valve shall open to allow City water to be pumped into the Base system. The check feature of the valve shall prevent City water from entering the Base system when the City system is at a higher pressure than the Base, which would be the case when the Base system is configured to divert City water to the new blending tank. A backflow preventer currently exists at the metering station to prevent Base water from entering the City system when the Base system is at a higher pressure than the City system. The control valve shall be no smaller than the same nominal diameter of the pump outlet. The Contractor shall make all necessary modifications to the piping and equipment at the pump house to ensure the new valve operates correctly and automatically.

(2)

(2)

- (2) 3.7.10 **Well 1 Pumping Unit Modifications.** Currently, flow from well 1 is discharged through an 8-inch line to an 18-inch line that conveys the combined flows from wells 1, 2 and 4 to the two existing IMG ground storage tanks. Once the required modifications to the Base water system are complete, well 1 will discharge into a system of pipes that will now be capable of conveying simultaneously, the flows from wells 3, 14, 15, and 16, and City water, in addition to wells 1, 2, and 4. See Diagram 1 in Appendix N for reference. The operating characteristics of well 1 will be altered as a result of the increased flow at the discharge point of well 1. The Contractor shall modify the well 1 pumping unit (pump and motor), as necessary, to ensure it will be capable of pumping its rated flow (600 gpm) into the storage tanks while operating within 3% of its maximum rated efficiency. For computation purposes, it shall be assumed that 5000 gpm is flowing in the existing 18-inch main line that well 1 discharges to. The modified pumping unit shall be tested and certified by the manufacturer of the unit to operate at the required efficiency.

3.7.11 **Wells 15 and 16 Pumping Unit Modifications.** Diverting the flow from wells 15 and 16 to the new blending tank, as required by the RFP, rather than directly into the distribution system as currently done, will alter the operating characteristics of the pumping units (pump and motor) at these wells. The Contractor shall modify the pumping units, as required, to ensure the pumping units operate within 3% of their maximum rated efficiency. The flow rate currently produced by the pumps shall not be reduced. The modified pumping units shall be tested and certified by the manufacturer of the units to operate at the required efficiency.

(2)



(2) 3.7.12 **Supervisory Control and Data Acquisition (SCADA).** See paragraph (2) ELECTRICAL DESIGN for the SCADA system design requirements.

(2) 3.7.13 **Water System Down-Time Considerations.** At any one time during the construction period, two of the three large capacity wells (wells 14, 15, and 16) shall remain fully operational to pump water into the distribution system. This applies to the work required to modify the discharge piping of these wells as indicated in paragraph: **New Collection Lines for Wells 14, 15, and 16.** All three of the large capacity wells shall be in service during periods when the pumps at the main booster station are taken out of service for upgrade work indicated in paragraph: **Pump Station Upgrade.**

3.8 **Flushing Stations.** The Contractor shall construct, at several locations described below, flushing stations for Base water system operators to manually flush water from the new well collector lines should it become necessary to do so in the future. The stations shall consist of all piping, valves and fittings required to manually discharge water from the line on which they are installed. Flushing station piping, valves and fittings shall be 8-inch diameter minimum. Stations shall be located in areas accessible to service vehicles but where the opportunity for damage to the equipment by vehicles is minimized. Bollards shall be provided to prevent damage to the stations by service and other vehicles. Flushing stations shall not be located in areas subject to flooding where the flushing station outlet might become submerged. To prevent contamination, station outlets shall be fitted with a flap valve and shall be located a distance above the ground surface as required by code. Erosion protection shall be provided at the flushing station outlets to prevent damage to the surrounding ground or landscaping when flushing occurs. A separate flushing station shall be provided for each of the following water lines: the new well 3 collector line; the new well 14 collector line; the new well 15 collector line; the new well 16 collector line; the new City Water diversion line; and the new 2MG blending tank inlet and outlet lines. The Contractor shall determine the optimum locations to install the flushing stations. Tamper protection shall be provided at the flushing stations to prevent unauthorized operation of the stations or deliberate contamination of the water system through the stations.

3.9 **Water Sampling Stations.** The Contractor shall provide a sampling station on both the main inlet and outlet lines of the new 2MG blending tank. Sampling stations are installed for the purpose of obtaining water samples from the system for testing. Sampling station piping and valves shall be 3/4-inch nominal diameter minimum. Sampling stations shall have a lockable aluminum or steel cover for weather and tamper protection and, shall be of freeze proof design.

3.10 **Freeze Protection.** All equipment provided and installed by the Contractor as part of this project, which is subject to damage by freezing, shall be installed with freeze protection.

3.11 **Water Line Routing.** New water lines to be constructed in this project shall be routed generally as shown on Figure B-2 of the *KAFB Drinking Water Blending Feasibility Study* unless otherwise indicated. Water line routes shall

be aligned parallel with the KAFB street grid and shall not cut diagonally across open lots. Water line routes shall follow existing established utility corridors to the maximum extent possible. New water lines shall be constructed within the unpaved shoulder areas of street and roadway rights-of-way and shall not be constructed under roadway pavements except at crossings.

**3.12 Street Crossings.** Construction of water lines across Gibson Blvd, Randolph Ave, and San Mateo Blvd shall be accomplished by boring under the roadway so that traffic impacts to these streets are minimized. Open trench construction at the remaining street crossings is acceptable, however, one half of the roadway width shall be kept open at all times for Base vehicle traffic.

**3.13 Traffic Control.** A traffic control plan shall be developed by the Contractor for all work that will take place within street and road rights-of-way. The traffic control plan shall include the requirements for all signage, barriers, barricades, lighting, detours, etc. and shall be submitted to the Contracting Officer for approval. The Contractor shall provide notice of proposed traffic lane closures a minimum of 14 days in advance.

**3.14 Access to Base Facilities and Residences.** The Contractor shall maintain vehicular access to all residences and other Base facilities at all times for the duration of this project.

**3.15 Water Line Materials.** All pipeline materials and products shall meet the requirements of the American Water Works Association (AWWA) Standards except that reinforced thermosetting resin pipe (RTRP), if used, shall meet the requirements of the American Society for Testing and Materials (ASTM). New pipeline shall conform to the cast iron outer diameter (CIOD) standard. Acceptable choices for buried pipe are: AWWA C900 polyvinyl chloride (PVC), AWWA C905 PVC, AWWA C906 polyethylene (PE), AWWA C909 oriented polyvinyl chloride (PVC), ASTM D2996 or D2997 reinforced thermosetting resin pipe (RTRP), AWWA C950 reinforced plastic pressure pipe (RPMP), or AWWA C151 ductile iron. Regardless of the internal pressure or trench load on the new water lines the minimum pressure class of pipe shall be 150. Ductile iron pipe including all fittings, valves, and appurtenances, if installed underground, shall be fully encased within a polyethylene liner of 8-mil minimum thickness in accordance with AWWA C105 and shall be cathodically protected. Requirements for cathodic protection are in the paragraph ELECTRICAL DESIGN.

**3.16 Water Line Fittings.** All water line fittings shall meet the requirements of the American Water Works Association (AWWA) Standards and shall be of equal or greater pressure class than the pipe on which they are installed. The Contractor shall ensure that the corrosivity of the soil, within which the water line will be constructed, is considered when selecting fittings and the bolts, nuts, rods, couplings, etc. for fittings. Fittings and components of fittings that are composed of ferrous materials and, that are in contact with the soil, shall be cathodically protected in accordance with paragraph ELECTRICAL DESIGN. The soils along the water line routes are considered highly corrosive.

3.17 **Water Line Bends.** The alignment of water lines shall be designed to keep the number of bends installed on the water lines to a minimum. Horizontal bends shall not exceed 90 degrees while vertical bends shall not exceed 22.5 degrees.

- (2) 3.18 **Valves.** Unless otherwise indicated in the RFP, diversion and isolation valves shall be buried gate valves. Valves shall be in accordance with guide specification 02510. Valves shall be of the same nominal diameter as the water line on which they are installed unless otherwise indicated in the RFP. Isolation valves shall be provided, unless otherwise indicated, on all new water lines in this project at an interval not to exceed 500 feet. Valve boxes over the new buried valves shall have locking covers to prevent unauthorized operation of the valves.

(2)

3.19 **Valve Vaults.** Valve vaults shall be constructed of reinforced concrete walls and floor in accordance with the requirements in paragraph STRUCTURAL



due to UV radiation, it shall extend into the ground a minimum of 24", and above ground a minimum of 6", and shall have a flange all around the base for weight distribution and uplift control. The sleeve shall be installed per all manufacturer recommendation.

**8.2.3.3 Equipment Grounding.** One 3/4 in. x 10 ft. copper clad ground rod shall be installed in a conduit window of each equipment pad (where transformer pads have more than one conduit window, the ground rod shall be installed in the secondary/low voltage window). The pad's counterpoise shall be connected to the ground rod with two runs of # 4/0 copper cable. All underground grounding connections shall be exothermic type connections. All other equipment grounds shall be bonded to this ground rod with bronze saddle clamps. The equipment grounding conductors shall be AWG #4/0 bare copper.

**8.2.4 Service Entrance.** The building shall be fed from the transformer via secondary conductors in duct sized for the connected load of the building. The service entrance conductors shall not be larger than 500 kCM. If the ampacity of the total load exceeds the ampacity of 500 kCM wire, then parallel runs of conductors shall be used. Parallel runs shall be installed as required by the NEC.

(2) **8.2.4.1 Service To Auxiliary Booster Station.** A new power service shall be provided for the Auxiliary Booster Station at the new water Tank. The service shall connect into the existing KAFB primary system at sectionalizer # Z17013 (on the west side of Texas St., approximately 150 north of M St.), provide a lateral primary feeder to a new padmounted transformer, which shall supply a new exterior WP, padmounted, free standing, circuit breaker panelboard, with service entrance metering and surge protection. The panelboard shall in turn supply motor controls (motor starter & etc.) as necessary to power and control the new Booster Pump. (2)

**8.2.5 Communications.**

**8.2.5.1 Communications Systems.** Communications systems shall be provided as necessary to support the new SCADA installations. New exterior communications systems shall be installed per the requirements below.

**8.2.5.1.1 Pull ropes** shall be provided in all spare conduits for future installations. Install electrical power cables in separate trench from the telephone and cable television systems. Maintain utility separation of 12" min. when using same trench, for electrical services such as SCADA system FO, LAN, etc. Ensure that all comm. conduits have a minimum of 30 inches bend radius, entrance conduits rise a minimum of 3 inches above finished floor, and only one 90 degrees bend is permitted in any duct run. If these are different from any of the standards, the most stringent requirement shall apply. Contractor shall ensure, by raising manhole cover heights as required, that excess water does not use the communication manholes for drainage and the underground communication lines shall not be damaged. The Contractor shall coordinate with each communication company or squadron as necessary, and shall provide and install conduits, cabling, cabinets, backboards, etc., as required for a complete and operational system.

**8.2.5.1.2 Fiber Optic Cable.** Where fiber optic cables are installed, they shall be a minimum of 6 strands, single mode, all with a weather proof, UV resistant, exterior rated outer jacket.



8.2.5.2 **Communications (SCADA FO). Conduits/Raceway.** Provide and install the following raceway systems where fiber optic (FO) cables are required as part of this project:

a. One (1) 2" dia. (min.), Sch. 40 PVC conduit, buried a minimum of 30" BFG.

b. Where UG conduits cross roadways, the conduit shall be concrete encased under the roadway, with 3000 PSI (min.) concrete, and the concrete encasement shall extend a minimum of 10ft. beyond the paving on both sides of the roadway.

#### 8.2.6 **Miscellaneous.**

8.2.6.1 **Road Crossings.** It shall be the responsibility of the Contractor to provide proper coordination and obtain all necessary permits, approvals, etc., before installing electrical duct bank or cable crossings. All road crossings of existing roads shall be done with boring; Contractor shall provide steel casing sleeve for electrical utility concrete.

8.2.6.2 **Utility Crossings.** Clearances from existing and new utilities (water, gas, sewer, etc.) shall be as specified in ANSI C2.

8.2.6.3 **Underground Splices.** Underground connections or splices shall not be permitted in primary or secondary conductors.

8.2.6.4 **Equipment Painting.** All padmounted and surface mounted equipment shall be provided in Sherwin Williams Western Reserve Beige color.

(2) 8.2.6.5 **Cathodic Protection.** Cathodic protection shall be provided for all ferrous materials installed in contact with earth and for all new water tanks. This is true whether the ferrous materials are provided with protective coatings or not. The Cathodic Protection shall be an impressed current type system for pipes, tanks, and other extensive systems or a sacrificial anode type system for isolated equipment (e.g.: iron valves used with plastic pipe), and shall be compatible with and installed per the KAFB Design and Compatibility Standards. Both types of system shall be provided with test points, and the sacrificial type system shall be design to provide a full 25 years of protection. The cathodic protection system shall be designed by a NACE certified Corrosion Specialist with a minimum of 4 years of experience in corrosion protection and the design shall be submitted for government approval (this design submittal and approval may be handled as a construction submittal as necessary). PVC coated RGS electrical conduits, re-bar encased in concrete, and anode-less risers, shall not require cathodic protection; all other ferrous materials, as described above, do.

(2)

8.2.6.6 **Obstruction Lights.** All new tanks and tower structures shall be provided with FAA standard obstruction lights.

#### 8.2.7 **Demolition of Existing Exterior Electrical Systems.**

8.2.7.1 The existing padmounted transformer, if required to be replaced, shall be turned over to the KAFB exterior electrical shop.

8.2.7.2 **Salvage Equipment.** No equipment or materials being removed from the project shall be reused. Existing light and power poles, which are being removed, shall be turned over to the Government. All other salvaged equipment

building disconnecting means. The main panel shall have indicating instruments, which shall show current and voltage for all three phase, line-to-ground and line-to-line. All service equipment shall be "fully rated" for available fault current. This service entrance equipment shall provide power for all downstream devices, panels, etc. There shall be one meter for voltage and one for current. The service entrance equipment shall be provided with LCD - kWh demand meter(s) RF readable type and instrumentation to monitor all power provided to the building from the normal power source the meter shall be able to measure the energy consumption and shall be capable of connection to the EMCS system.

(2) 8.3.6 **Lightning Protection System.** The Main Pumping Station Building (Bldg. # 20370) shall be provided with a Lightning Protection System per NFPA 780. All riser cables shall be concealed. The completed system shall be provided with a UL Master Label. (2)

8.3.7 **Sizing Services and Feeders.** Demand load and sizing calculations shall be provided in the format used in the current edition of the National Electrical code, Chapter 9, Part B, Examples. Estimated loads shall be included in the calculations for future and spare equipment, and all equipment listed in the subparagraphs of "Interior Electrical, Dedicated Circuits".

8.3.8 **Panelboard Feeders.** Panelboard feeders from the service shall be sized to supply the full load rating of the panel that they serve. For instance, a panel with a 100 amp demand load shall be fed by 100 amp wire.

8.3.9 **Panelboards.** Secondary and local panelboards shall be sized for a minimum of 125% of the demand load they serve. They shall be fully rated for the available fault current and furnished with main circuit breakers (unless fed from an upstream panel breaker, in which case they may have MLO), full sized bolt-on branch breakers, insulated neutral busses and bonded equipment grounding busses. Panelboards shall be recessed with flush fronts and hinged doors. Panelboards shall be centrally located in the building electrical rooms. Twenty-five percent of single pole spaces (minimum) shall be provided for spares. The Contractor shall provide and install printed labels in the panelboard for all installed circuits. Panelboard buses shall be copper, aluminum buses shall not be allowed. Contractor shall removal all references to aluminum buses from specifications.

8.3.10 **Surge Protection.** The building power supply system shall be provided with a surge protection system. The system shall consist of surge protection packages and modules installed in or connected to all panelboards, MCCs, switchboards, and switchgear. The surge protection packages shall consist of three levels of protection: 1) The main panel level (for service entrance panels, MDPs, MCCs, switchgear, etc.), 2) The secondary panel level (for distribution panels, switchboards, etc.), 3) The local panel level (local panelboards and power panels). One package of the appropriate size and level of protection shall be installed in all panels.

8.3.11 **Conductors.** All conductors shall be copper; The Contractor shall remove all reference to aluminum conductors from specifications. Conductors

8.4.1 **SCADA System Central Equipment.** The new SCADA system shall, at a minimum, include the following central SCADA system equipment, which shall be located in the Control Room, in the Booster Pump Station (Bldg. # 20370, located @ Texas & K).

Two (2) complete SCADA system desktop computer systems, each to include: a 2.8GHz or better Pentium CPU, 800 MHz bus speed, 1024 Mb DDR-RAM, 60 Gb IDE HDD, 3COM Combo Network Adapter, one DVD/RW+CD/RW combination drive, one 3.5" 1.44 Mb FD, 32 Mb Video Card, 32 bit sound blaster Audio, (2) Serial Ports, (3) USB Ports, (1) Parallel Port, keyboard, mouse, mid tower Case, and a 21" full color P1110 video monitor for SCADA systems. The SCADA system desktops and server (below) shall be provided with MicroSoft Windows NT Operating System software.

One (1) additional 40 Gb IDE HDD, for historical data, on main server.

Two (2) 10/20 Gb Travan 5 (or equal) tape drives, one for each desktop.

A 4 port communications server, with capacity and speed to allow full speed operation of the desktop machines above.

Telemetry connections into the server for both telephone modem connections, and fiber optic I/O.

A telephone dial up modem for remote telephone dispatch and alarms.

A full UPS power supply for desktop and server systems. The UPS shall be a full time, on line type system, with a minimum of 30 minutes of power supply for both desktop units.

A printer for both SCADA computers. The printer shall be a LAN connected, full color laser printer, capable of printing on both 8.5x11 and 11x17 paper, and shall be an HP Color Laser 5500 printer, or equal.

With full Cat 6 EtherNet LAN connections for all of the above.

8.4.2 **SCADA System Remote Site Equipment.** The new SCADA system shall, at a minimum, include the following Remote Site SCADA system equipment.

(2) 8.4.2.1 **Equipment.** Provide sensors, connections, RTUs and interface front panels at each well, pump, booster pump, and tank site, within the KAFB base wide water system, as listed below and as given in the Civil portion of this document, to provide the monitoring and control functions listed below. RTUs and interface panels shall be provided with PLC type power supplies with 6 hr battery backup with charger, EMI/RFI I/O filtering, 24 VDC power supply, condensation heater with built-in thermostat, and a GFI protected duplex 120 Volt receptacle. Some sites and the Main Pump Building have some existing RTUs and interface panels and other SCADA equipment. All of this existing SCADA equipment shall be removed and turned over to the Government.

(2)



8.4.2.1.1 **Water Sites.** The following list provides the sites at which SCADA equipment and connections shall be provided.

Well # 1  
Well # 2  
Well # 3  
Well # 4  
Well # 14  
Well # 15  
Well # 16  
Water tank # 28055 (3.5M Gal. @ Eubank)  
Water tank # 28032 (1 M Gal. @ Eubank)  
Water tank # 23901 (.5M Gal. @ N Central KAFB)  
Water tank # 20373 (1M Gal. @ Texas & K)  
Water tank # 20372 (1M Gal. @ Texas & K)  
Water tank -New Tank- (2M Gal. @ Texas & M)  
Metering Point (Connection to Abq. City water @ Gibson & School)  
Booster Pump Station (Control House @ Texas & K)  
Chlorination Bldg. (@ Texas & K)  
Auxiliary Booster Station at new Tank.

(2)

(2)

8.4.2.2 **Connectivity.** At each remote site provide telemetry equipment and connections for either telephone modem I/O or fiber optic I/O connections as required in the options below.

(2)

8.4.2.2.1 **Base Bid.** As a base bid, provide a dedicated, spread spectrum radio communication system for connections between all of the remote sites listed above and the central SCADA system computer equipment located in the Control Room (@ Texas and K). The Contractor shall coordinate, through the Contracting Officer, with the KAFB Comm. Squad, to provide assigned switch number (as opposed to telephone phone number) modem connections. Note: Providing the SCADA connections via assigned switch numbers instead of regular telephone numbers is intended to reduce the system vulnerability to dial in hackers.

(2)

8.4.2.2.3 **Bid Option.** As a Bid Option, provide fiber optic (FO) connections between the Central SCADA system (@ Texas & K), and all remote sites defined above. The FO cables used shall be the existing FO LAN cable owned and operated by the KAFB Comm. Squad. The Contractor shall provide all LTUs and other connections necessary to make the SCADA system operate using the FO cables. In the cases where the existing FO cables do not extend to the remote sites, the contractor shall provide the FO cable necessary to make the full system connection. In these cases the FO cable may be either OH on an existing pole line or installed UG. (Note: For proposal/bid purposes the contractor may assume that all remote sites need an additional 300 ft. of FO to extend from the existing FO LAN system to each remote site.)

(2)

(2)

8.4.3 **SCADA System Operation.** The SCADA system shall remotely monitor, control, and alarm on the water system operation and conditions as listed below.

8.4.3.1 **Monitoring.**

At each well or pump, monitor pump electric motor on-off condition.  
At each well or pump, monitor pump electric motor trip-off

8.4.4.7 The system software shall provide for and allow full manual control, through the SCADA system, of all control points defined above.

8.4.4.8 The system software shall provide for remote graphics displays (similar to "PC Anywhere").

8.4.5 **Surge Protection.** All SCADA system components, both central and remote, shall be provided with full over voltage surge protection. This protection shall be in addition to any upstream protection in panels or panelboards.

8.4.6 **Support.** The SCADA system shall be provided with full start up and continuous operational support for a 2 year period after system turn over.

8.4.7 **Warranty.** The SCADA system shall be provided with a full 5 year warranty on all equipment and software, for all Central SCADA system equipment, remote site sensors and operators, all connectivity materials and equipment and all miscellaneous parts. The warranty shall include full replacement for parts and labor.

## 8.5 Miscellaneous.

(2)

8.5.1 **Outages.** The Main Pumping Station Building, Pumps, and equipment may be out of service for a maximum of 72 hours, total time for cutover to new service. All designs and installations shall be done to allow conversions and cutover with a maximum outage time of 72 hours. This 72 hours refers to the total building. Outages on individual equipment (e.g., a single pump) that does not affect the operation of the water system as a whole may be scheduled as necessary to complete the work. For additional outage requirements see the Civil section of this document. All outages shall be scheduled and pre-approved through the Contracting Officer and the KAFB BCE a minimum of 30 days ahead.

(2)

8.5.2 **Documentation.** The SCADA system shall be provided with a full set of operations and maintenance manuals, which shall be in sufficient detail to permit a technically competent, entry level programmer to readily make programming modifications to the system. Preliminary copies of this documentation shall be submitted during design for approval.

8.5.3 **Test and Operation.** The SCADA system shall be fully tested and operated, in full operational status, by the contractor, for a period of 30 days, prior to system turn over.

8.5.4 **Training.** The contractor shall provide system operator training on the SCADA system, for KAFB personnel. The training shall be provided consist of three levels; 1) maintenance, 2) operator, and 3) programmer levels. The training shall be conducted by personnel employed by the contractors system integrator familiar with the system supplied and that have experience and training in developing and implementing instructional courses. The training provided shall consist of a minimum of 3 days (24 hours) of training for each of the above defined levels.

8.5.5 **Video Taping.** The contractor shall video tape all training sessions. Video recorder and tapes shall be supplied by the contractor. Tapes shall remain the property of the government.

APPENDIX INDEX

- APPENDIX A - DRINKING WATER BLENDING FEASIBILITY STUDY
- APPENDIX B - FINAL CONCEPT DRINKING WATER SYSTEM TECHNICAL REPORT
- APPENDIX C - PUMP CURVES FOR EXISTING PUMPS
- APPENDIX D - BASE UTILITY AND TOPO DRAWINGS
- APPENDIX E - FINAL FOUNDATION DESIGN ANALYSIS EXAMPLE
- APPENDIX F - FINAL PAVEMENT DESIGN ANALYSIS EXAMPLE
- APPENDIX G - GEOTECHNICAL INFORMATION
- APPENDIX H - SPECIFICATIONS GUIDANCE
- APPENDIX I - DESIGN ANALYSIS GUIDANCE
- APPENDIX J - DRAFTING STANDARDS
- APPENDIX K - METRIC DESIGN GUIDE
- APPENDIX L - REVEGETATION AND EROSION CONTROL
- APPENDIX M - ARCHITECTURAL COMPATIBILITY STANDARDS  
AND POLICY LETTER NO. 69
- (2) APPENDIX N - SUPPLEMENTAL WATER SYSTEM INFORMATION (2)



FORM NO. 282B002

WCC # 1

SURFACE DISCHARGE

Ø TO FACE OF FLANGE

MOTOR: \_\_\_\_\_ MFR. *VAC* TYPE \_\_\_\_\_

150 H.P. 60 CY. 440 VOLTS

1800 R.P.M. 3 PH. FRAME

BASE TO  $\frac{1}{2}$  OF DISCHARGE

**DISCHARGE COMPANION FLANGE FOR:**

8X8X16 1/2 DISCHARGE HEAD

Q.D. TOP COL. FLANGE

I.D. OF WELL

Q.D. OF  
COUPLING

8" COLUMN

1 1/4 SHAFT

3 TUBE

BOWL UNIT:

DMA ASSEMBLY

**14# STAGE**

### Q.D. OF BOWLS

**SUCTION  
PIPE**

**STRAINER:**

SIZE 0.0

TYPE

PUMP RATING

G.P.M. 650

FT. FIELD HD. 579

\$Q. NO.

SOLD TO: AREF  
Well #1

ORDER NO.

USER:

ITEM NO.

**PUMP IDENTIFICATION:**

THIS CERTIFIED PRINT

☐ FOR APPROVAL

BY \_\_\_\_\_ DATE \_\_\_\_\_

**FOR CONSTRUCTION**

BY \_\_\_\_\_ DATE \_\_\_\_\_

PEERLESS PUMP  
HYDRODYNAMICS DIVISION  
FOOD MACHINERY & CHEMICAL CORPORATION

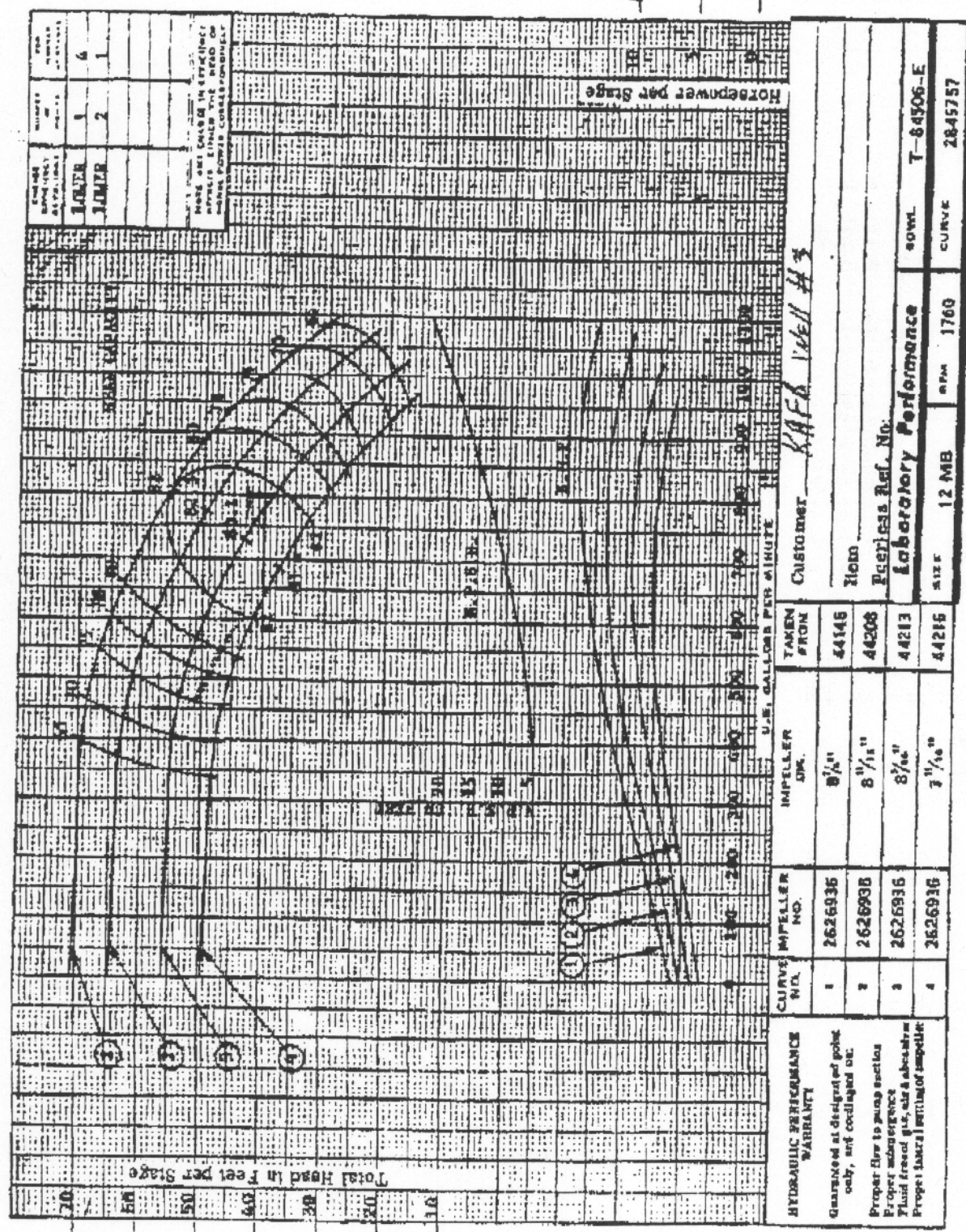
DRN. BY: \_\_\_\_\_ CHK'D BY: \_\_\_\_\_ DATE: \_\_\_\_\_

PUMP NO



## WELL 3

Well 3



Peerless Pumps  
Total Head in Feet for 7 Stages



200 Rosewood Rd. S.W., Albuquerque, NM 87105  
(505) 877-0287

PUMP DESCRIPTION: Driver 150HP SUB Head 555 ft; EM 22.5% BHP 140  
GUARANTEED BOWL PERFORMANCE: Capacity 800 gpm Head 555 ft; EM 22.5% BHP 140

## **APPENDIX N**

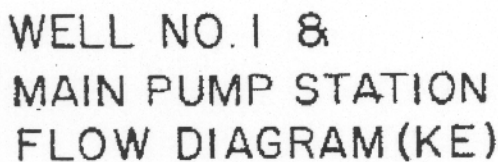
### **SUPPLEMENTAL WATER SYSTEM INFORMATION**

## DIAGRAM 1

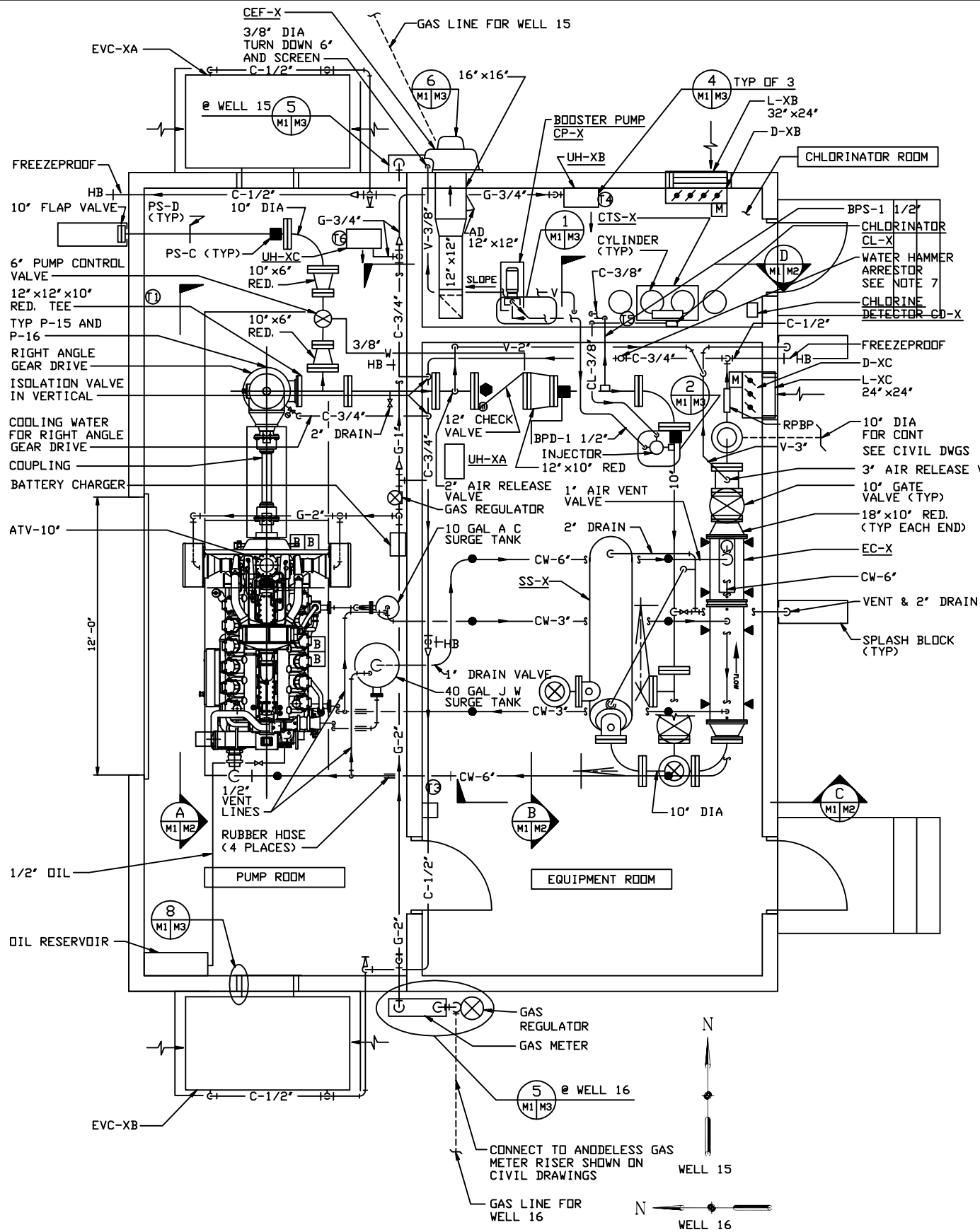




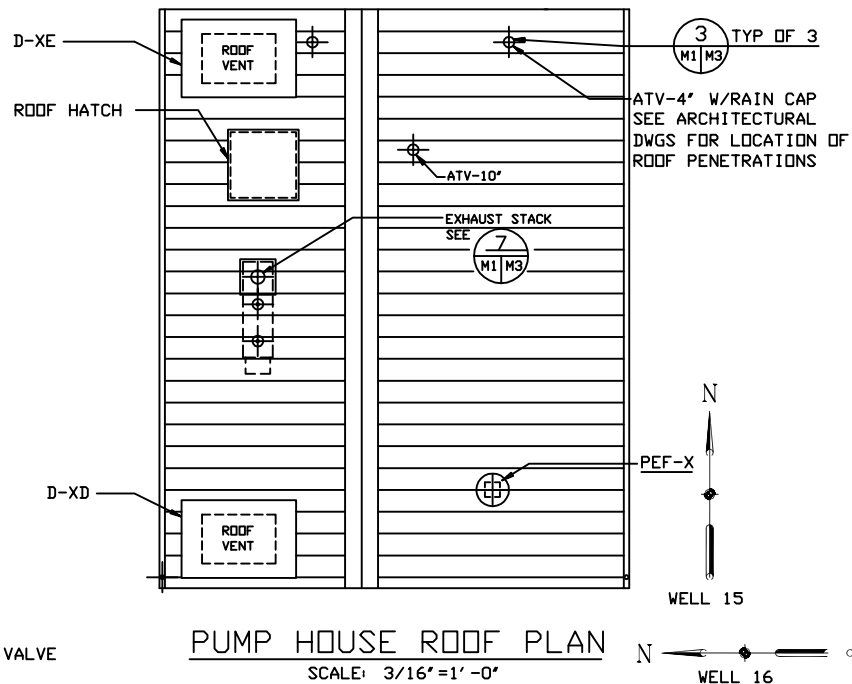
MAIN PUMP STATION  
FLOW DIAGRAM







PUMP HOUSE FLOOR PLAN  
SCALE: 3/8" = 1' - 0"



PUMP HOUSE ROOF PLAN  
SCALE: 3/16" = 1' - 0"

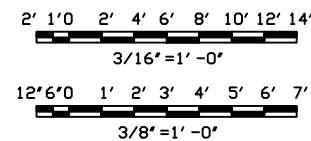
### MECHANICAL LEGEND

	GAS REGULATOR		DUCT (1ST FIGURE, SIDE SHOWN 2ND FIGURE, SIDE NOT SHOWN)
	GLOBE VALVE		DIRECTION OF FLOW
	GATE VALVE		DUCT SECTION (EXHAUST OR RETURN)
	TIMED CHECK VALVE		TRANSITIONS: GIVE SIZES. NOTE F.O.T. (FLAT ON TOP) OR F.O.B. (FLAT ON BOTTOM) IF APPLICABLE
	HOSE BIB		ACCESS DOOR (AD)
	STRAINER		PARALLEL BLADE DAMPERS
	SOLENOID VALVE		UNIT HEATER
	PRESSURE REDUCING VALVE		THERMOSTAT
	BUTTERFLY VALVE		MOTOR OPERATOR
	BALL VALVE		PRESSURE INDICATOR
	ELBOW DOWN		OVERPRESSURE SWITCH
	ELBOW UP		POTABLE WATER
	TEE DOWN		COOLING WATER
	TEE UP		CHLORINE GAS
	CAP		BOOSTER PUMP DISCHARGE
	UNION		BOOSTER PUMP SUCTION
	PIPE INCREASER OR DECREASER		VENT
	FLANGE		GAS
	BLIND FLANGE		
	AIR RELEASE VALVE		
	PIPE SUPPORT		

### PIPE SUPPORT TYPE

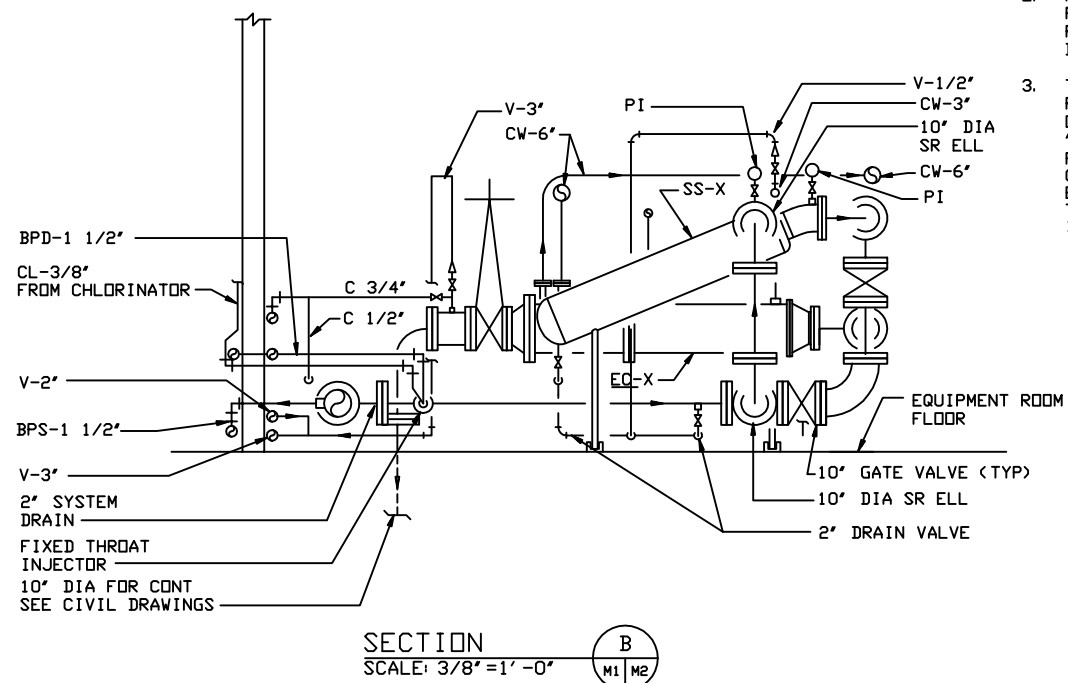
	PS-A (4 PLCS)
	PS-B (1 PLC)
	PS-C (3 PLCS)
	PS-D (2 PLCS)
	PS-E (8 PLCS)
	PS-F (2 PLCS)

SEE SHT M6 FOR PIPE  
SUPPORT DETAILS

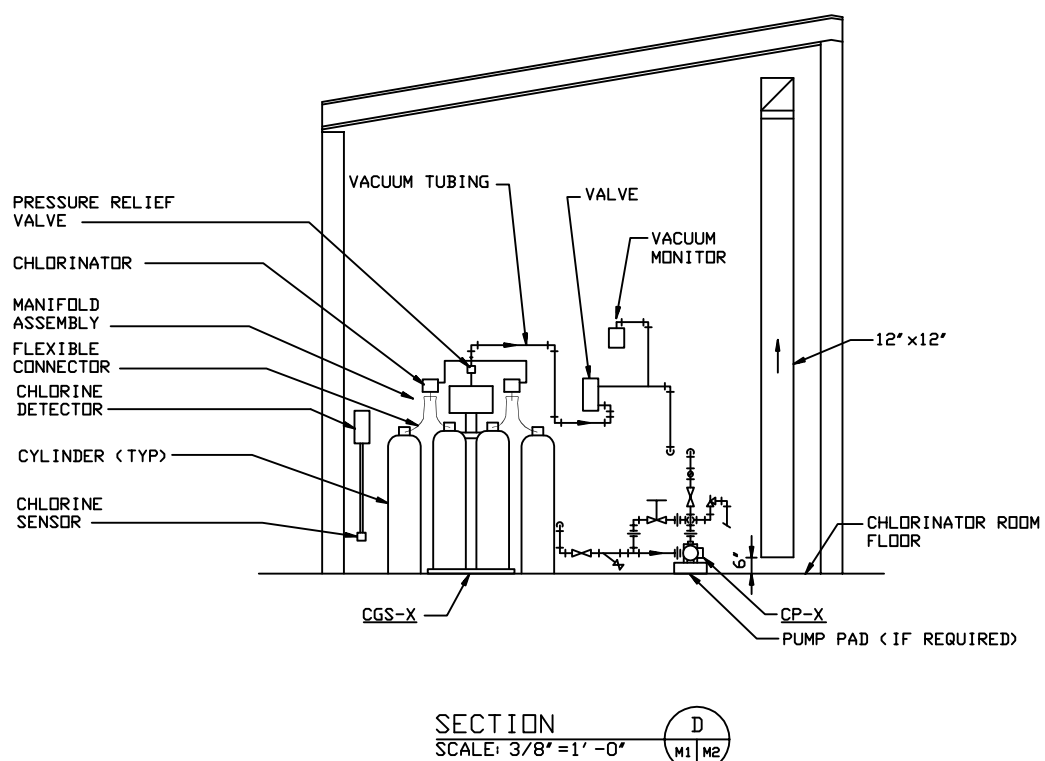




















### NOTES:

- FOR EQUIPMENT NUMBERS SEE GENERAL NOTES ON DRAWING M4. FOR EQUIPMENT DESIGNATIONS SEE DRAWING M4.
- ALL DUCTWORK SHALL BE ONE INCH PRESSURE CLASS.
- FOR PIPES 2 INCHES AND LARGER, THE LOCATION AND DESIGN OF PIPE HANGERS ARE SHOWN ON THIS DRAWING. FOR PIPES SMALLER THAN 2 INCHES, HANGERS ARE NOT SHOWN AND SHALL BE FIELD LOCATED AND INSTALLED. THE CONTRACTOR SHALL SELECT, FURNISH AND INSTALL HANGERS. THE NOMINAL SPAN FOR PIPES 1 INCH OR SMALLER SHALL BE 10 FT.
- SPACE ELECTRIC THERMOSTAT FOR EXHAUST FANS SHALL BE SINGLE STAGE, HEAVY DUTY, DPST, CONTACTS MADE ON TEMPERATURE RISE. WALL MOUNTED UNITS SHALL BE INDOOR TYPE, SUITABLE FOR 120/240 VOLT OPERATION. UNITS SHALL BE MERCID MODEL 860 OR ACCEPTABLE EQUAL.
- FOR INSTALLATION OF ROOF VENTILATORS SEE ARCHITECTURAL DRAWINGS
- SEE DWG. M3 FOR HVAC SEQUENCE OF OPERATION.
- WATER HAMMER ARRESTOR SHALL BE PDI-A.
- 6" PUMP CONTROL VALVE, SINGER MODEL 106 DW-RPS



- ## NOTES:
1. PRESSURE INDICATOR, OVERPRESSURE SWITCH, AND AIR VENT VALVE ARE PROVIDED AS PART OF SECTION 11212.
  2. ROUTE THE COOLING WATER OUTLET LINE FROM THE GEAR DRIVE TO A TAP IN THE PUMP DISCHARGE HEAD TO ALLOW WATER TO DISCHARGE TO THE WELL CASING.
  3. THE INSULATION MATERIAL SHALL BE REUSABLE THERMAL INSULATION BLANKET OF HIGH DENSITY, 11 LBS/CU FT, TYPE "E" FIBERS, FIBROUS GLASS, ASBESTOS FREE, INSULATION AS MANUFACTURED BY EQ EXHAUST SYSTEMS, INC OR ACCEPTABLE EQUAL. INSULATION SHALL BE 1 1/2" THICK AND SHALL BE SUITABLE FOR 1200 F.

[illegible]

DESIGN BY:	KT26M02.DWG
CHKD BY:	DATE
DRAWN BY:	06-17-96
RAK	1-32
REVIEWED BY:	DACA47-96-C-0013
VAP	                 

**BLACK & VEATCH**  
SPECIAL PROJECTS CORP  
OVERLAND PARK, KANSAS 66211

R. J. ROENITZKE  
UNLIMITED, INC.

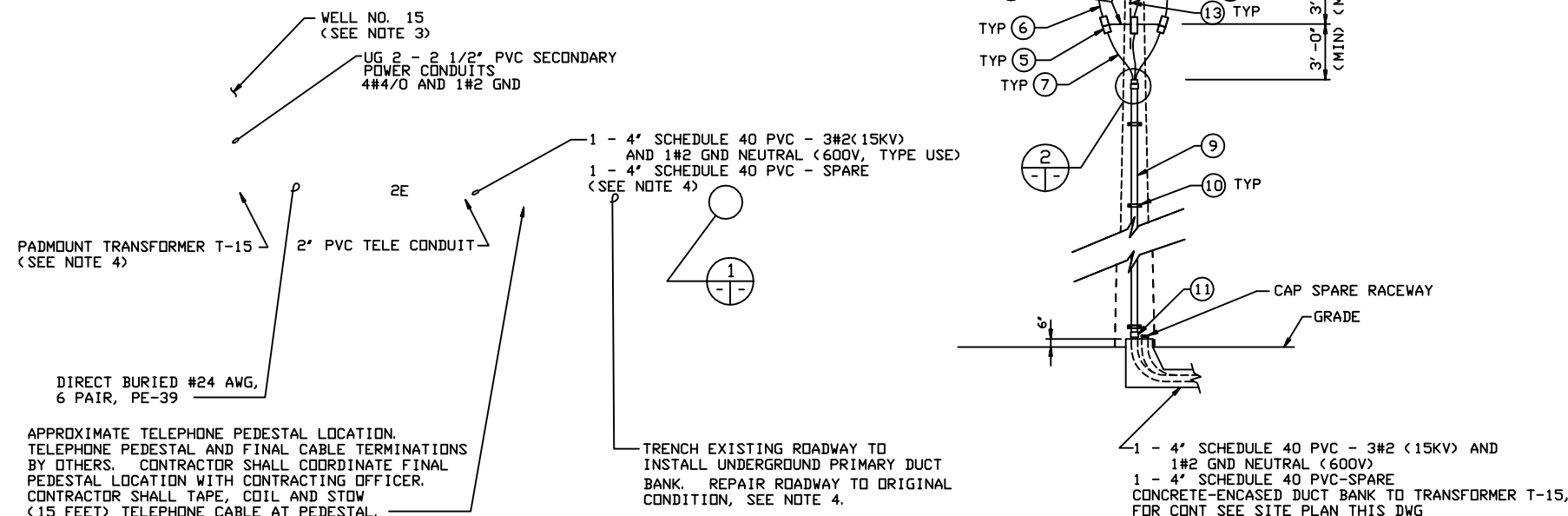
KIRTLAND AIR FORCE BASE ALBUQUERQUE, NEW MEXICO  
ADAL BASE WATER SYSTEM  
PUMP STATION - WELLS NO. 15 AND 16  
MECHANICAL SECTIONS



1. FOR DRAWING LIST, SEE DWG G1.
2. FOR ELECTRICAL LEGEND AND GENERAL NOTES, SEE DWG E1.
3. FOR POWER ONE LINE DIAGRAM, SEE DWG E2. FOR WELL NO. 15 PLANS, SEE DWGS E5 THROUGH E7.
4. FOR EXACT DUCT BANK ROUTING AND PADMOUNT TRANSFORMER LOCATION, SEE THE CIVIL DRAWINGS. PROVIDE TWO ADDITIONAL 4-INCH PVC SPARES AT ROADWAY CROSSING, CAP 5 FEET FROM EDGE OF PAVEMENT. DUCT BANK SHALL BE REINFORCED UNDER ROADWAY.

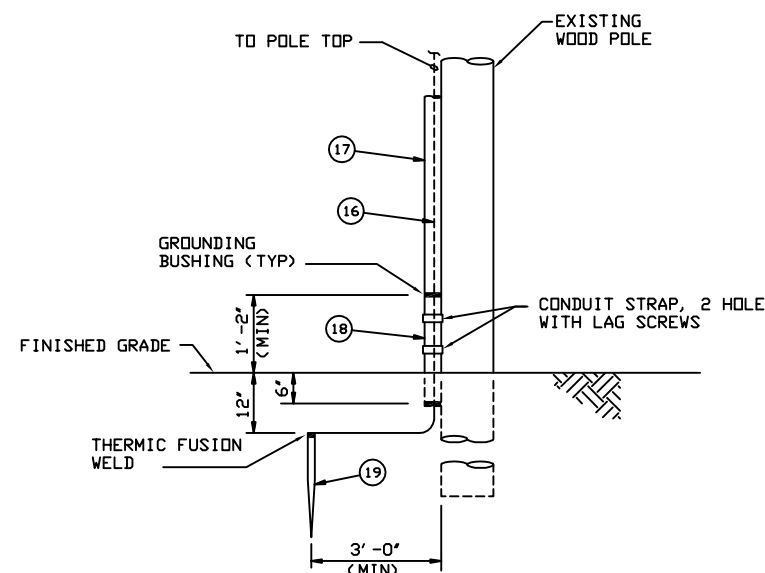
OVERHEAD PRIMARY DISTRIBUTION  
POLE LINE MATERIALS LIST:

- ① HOT LINE CLAMP, W/ STIRRUP.
- ② OHIO BRASS PDV-100 ARRESTER OR EQUAL, HEAVY-DUTY, METAL OXIDE DISTRIBUTION CLASS, 3KV RATED, 2.55KV MCOV, COMPLETE WITH ALL MOUNTING HARDWARE.
- ③ S&C TYPE "XS" OPEN DISTRIBUTION FUSED CUTOUT, 15KV, 95KV BIL, WITH 100 AMPERE FUSE HOLDER AND 25 AMPERE STANDARD SPEED FUSE LINK, COMPLETE WITH ALL MOUNTING HARDWARE.
- ④ MOUNTING BRACKET ASSEMBLIES FOR CABLE TERMINATORS, CUTOUTS, AND ARRESTERS.
- ⑤ JOSLYN NO. J9280 15KV CABLE TERMINATOR OR EQUAL.
- ⑥ #2 AWG BARE COPPER JUMPER WIRE.
- ⑦ 15KV POWER CABLE TYPE MV-90, #2 AWG, 7- STRAND SINGLE CONDUCTOR, ANNEALED COPPER, CONDUCTOR AND INSULATION SHIELDED, 133% INSULATION LEVEL, EPR.
- ⑧ THREADED CONDUIT GROUNDING BUSHING WITH SOLDERLESS LUG.
- ⑨ 4-INCH RGS CONDUIT.
- ⑩ 2 HOLE STRAPS WITH LAG BOLTS AT 6'-0" CENTERS.
- ⑪ 4-INCH RGS TO PVC CONDUIT ADAPTER, ADAPTER RGS.
- ⑫ SEALANT.
- ⑬ COMPRESSION, SPLIT-BOLT, OR PARALLEL GROOVE CONNECTOR - SIZE AND TYPE AS REQUIRED.
- ⑭ #4 AWG, BARE COPPER GROUND WIRE, CONNECT TO NEW POLE GROUNDING SYSTEM (SEE DETAIL THIS DWG).
- ⑮ CABLE GRIP.
- ⑯ POLE GROUNDING CONDUCTOR #4 AWG ANNEALED BARE COPPER, ATTACH TO WOOD POLE WITH STAPLES.
- ⑰ POLE GROUNDING CONDUCTOR GUARD, EXTEND 7'-0" AFG (MIN).
- ⑱ CONDUIT 3/4" RGS WITH GROUNDING BUSHINGS EACH END.
- ⑲ GROUND ROD 5/8"x10'-0" LONG COPPERCLAD STEEL.

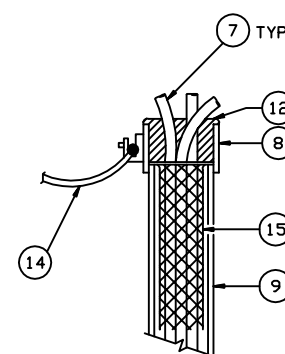


SERVICE RISER POLE LOOKING SOUTH

DETAIL  
SCALE: NONE




TYPICAL GROUNDING SYSTEM  
FOR EXISTING WOOD POLE  
SCALE: NONE



DETAIL  
SCALE: NONE




WELL NO. 15 SITE PLAN  
SCALE: 1"=30'



**United States Army  
Corps of Engineers  
ALBUQUERQUE  
DISTRICT**  
Albuquerque, New Mexico

[illegible]

DESIGN BY:	KTPE03.DWG
MDW/JLB	Issue
DRAWN BY:	Plot Scale 1=30
LEN	DACA47-96-C-0013
REVIEWED BY:	 RCT

**BLACK & VEATCH**  
SPECIAL PROJECTS CORP  
OVERLAND PARK, KANSAS 66211

R. J. ROENNIGKE

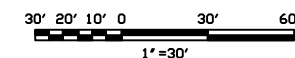
SUBMITTED BY: \_\_\_\_\_

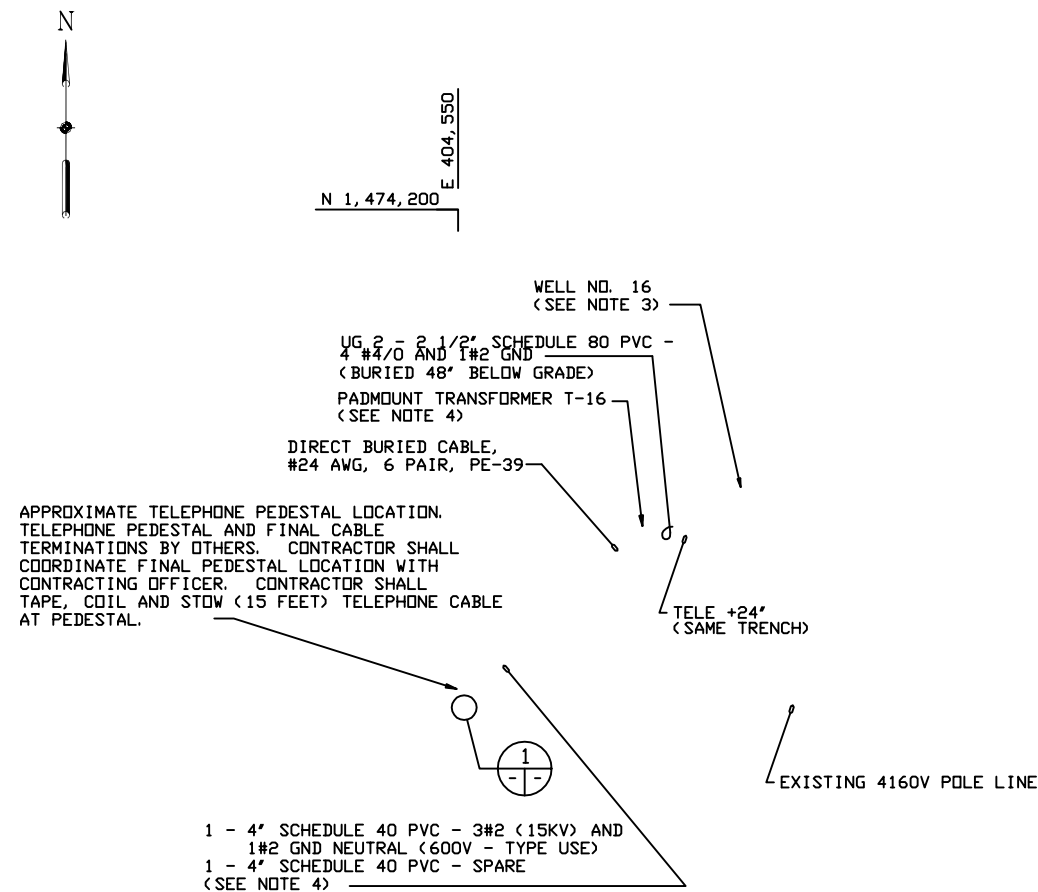
KIRTLAND AIR FORCE BASE      ALBUQUERQUE, NEW MEXICO  
ADAL BASE WATER SYSTEM

WELL NO. 15 SITE PLAN

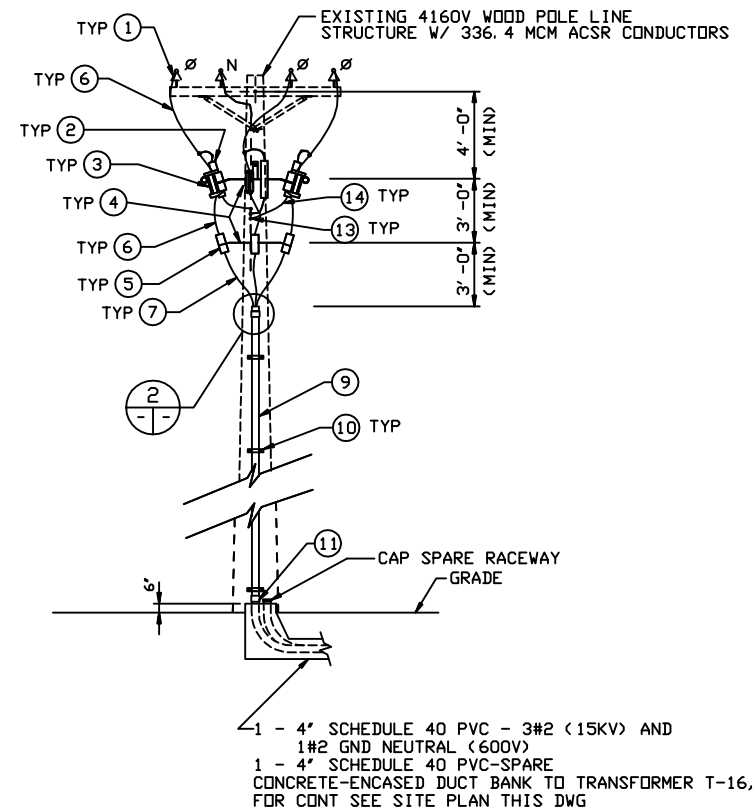
SHEET NO.  
E3 OF 110

SEQUENCE  
NO.



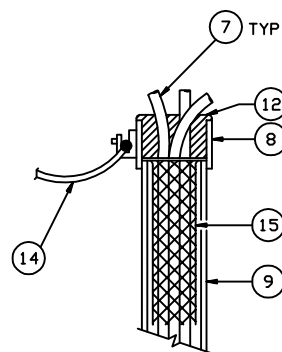


WELL NO. 16 SITE PLAN  
SCALE: 1"=30'



SERVICE RISER POLE LOOKING WEST

DETAIL 1  
SCALE: NONE



CABLE SUPPORT AT RISER

DETAIL 2  
SCALE: NONE

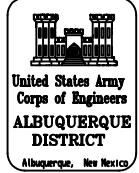
#### NOTES:

1. FOR DRAWING LIST, SEE DWG G1.
2. FOR ELECTRICAL LEGEND AND GENERAL NOTES, SEE DWG E1.
3. FOR POWER ONE LINE DIAGRAM, SEE DWG E2. FOR WELL NO. 16 PLANS, SEE DWGS E5 THROUGH E7.
4. FOR EXACT DUCT BANK ROUTING AND PADMOUNT TRANSFORMER LOCATION, SEE THE CIVIL DRAWINGS. PROVIDE TWO ADDITIONAL 4-INCH PVC SPARES AT ROADWAY CROSSING, CAP 5 FEET FROM EDGE OF PAVEMENT. DUCT BANK SHALL BE REINFORCED UNDER ROADWAY.

#### OVERHEAD PRIMARY DISTRIBUTION POLE LINE MATERIALS LIST:

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3. S&C TYPE 'XS' OPEN DISTRIBUTION FUSED CUTOUT, 15KV, 95KV BIL, WITH 100 AMPERE FUSE HOLDER AND 25 AMPERE STANDARD SPEED FUSE LINK, COMPLETE WITH ALL MOUNTING HARDWARE.
4. MOUNTING BRACKET ASSEMBLIES FOR CABLE TERMINATORS, CUTOUTS, AND ARRESTERS.
5. JDSLYN NO. J9280 15KV CABLE TERMINATOR OR EQUAL.
6. #2 AWG BARE COPPER JUMPER WIRE.
7. 15KV POWER CABLE TYPE MV-90, #2 AWG, 7- STRAND SINGLE CONDUCTOR, ANNEALED COPPER, CONDUCTOR AND INSULATION SHIELDED, 133% INSULATION LEVEL, EPR.
8. THREADED CONDUIT GROUNDING BUSHING WITH SOLDERLESS LUG.
9. 4-INCH RGS CONDUIT.
10. 2 HOLE STRAPS WITH LAG BOLTS AT 6'-0" CENTERS.
11. 4-INCH RGS TO PVC CONDUIT ADAPTER, ADAPTER RGS.
12. SEALANT.
13. COMPRESSION, SPLIT-BOLT, OR PARALLEL GROOVE CONNECTOR - SIZE AND TYPE AS REQUIRED.
14. #4 AWG, BARE COPPER GROUND WIRE, CONNECT TO EXISTING POLE GROUNDING SYSTEM.
15. CABLE GRIP.

30' 20' 10' 0 30' 60'  
1"=30'



REVISIONS	Symbol	Description	Date	App.

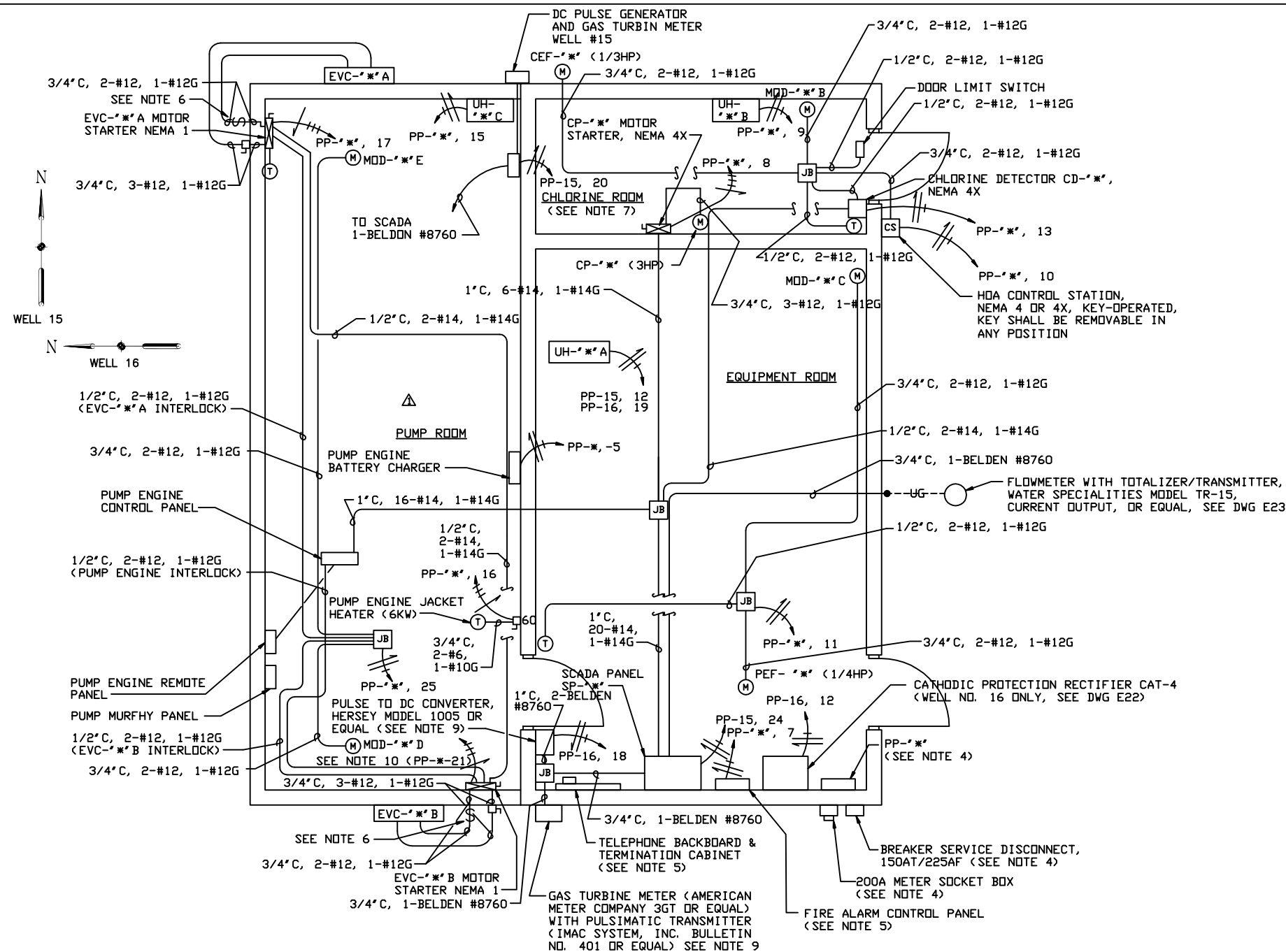
DESIGN BY: RWS/ALS	FILE NAME: KTRE604.DWG
DRAWN BY: LEN	PLT SCALE: 1"=30'
REVIEWED BY: RGT	DACN47-96-C-0013

BLACK & VEATCH SPECIAL PROJECTS CORP OVERLAND PARK, KANSAS 66211	SUBMITTED BY: R. J. REENIGUE
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KIRTLAND AIR FORCE BASE ADAL BASE WATER SYSTEM	WELL NO. 16 SITE PLAN
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SHEET NO. E4 of 110	SEQUENCE NO. 57
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# NOTES:

- FOR DRAWING LIST, SEE DWG G1.
- FOR ELECTRICAL LEGEND AND GENERAL NOTES, SEE DWG E1.
- FOR MECHANICAL EQUIPMENT LOCATIONS, SEE THE MECHANICAL DRAWINGS.
- FOR POWER ONE LINE DIAGRAM, SEE DWG E2. FOR PANEL SCHEDULES, SEE DWG E8.
- FOR FIRE ALARM, GROUNDING AND TELEPHONE PLAN, SEE DWG E7. FOR ONE LINE AND RISER DIAGRAMS, SEE DWG E2.
- SINGLE POLE TOGGLE SWITCH FOR EVC RECIRCULATION PUMP (120V AC, 1/20 HP). NEMA 3R, 4 OR 4X ENCLOSURE. PADLOCKABLE IN ON AND OFF POSITION.
- THE CHLORINE ROOM SHALL BE CONSIDERED A CORROSIVE ENVIRONMENT DUE TO THE POTENTIAL FOR CHLORINE GAS. ELECTRICAL MATERIALS AND INSTALLATIONS SHALL BE RATED NEMA 4X.
- FOR CONTROL SCHEMATICS, SEE DWG E15.
- COORDINATE EXACT EQUIPMENT LOCATIONS WITH HVAC LOUVER LOCATED ON THIS WALL, SEE DWG M1.
- PP-\*, BREAKER NUMBER TO BE DETERMINED IN FIELD.
- SEE DWG A1 FOR EXACT BUILDING DIMENSIONS.



United States Army  
Corps of Engineers  
**ALBUQUERQUE DISTRICT**  
Albuquerque, New Mexico

REVISIONS	Symbol	Date	Appr.
1		5/15/98	
2		5/19/97	
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File Name	KTRE005.DWG
Plot Scale	1"=10'
Plot Date	5/15/98
Design By	LEN
Drawn By	LEN
Reviewed By	LEN
Check By	LEN
Approved By	LEN
Submitted By	LEN
Submitted Date	5/15/98

DESIGN BY	LEN
DRAWN BY	LEN
CHECKED BY	LEN
APPROVED BY	LEN
SUBMITTED BY	LEN
SUBMITTED DATE	5/15/98

**BLACK & VEATCH**  
SPECIAL PROJECTS CORP.  
OVERLAND PARK, KANSAS 66211

**KIRTLAND AIR FORCE BASE**  
**ALBUQUERQUE, NEW MEXICO**  
**ADAL BASE WATER SYSTEM**  
**WELL NOS. 15 AND 16**  
**POWER AND CONTROL PLAN**

SHEET NO.  
**E5 of 110**

SEQUENCE NO.  
**58**

